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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—The Mountains of California	81
The Strawberry in New England. *G. E. Stone.*	82
FOREIGN CORRESPONDENCE:—Orchids at Kew. *W. Watson.*	83
NEW OR LITTLE-KNOWN PLANTS:—Viburnum erosum. (With figure.) *C. S. S.*	84
CULTURAL DEPARTMENT:—Vegetable Notes. *William Scott.*	84
Seasonable Notes on Chrysanthemums. *T. D. Hatfield.*	85
Pentstemons. *E. O. Orpet.*	86
Warming Tanks for Victoria regia. *William Tricker.*	86
CORRESPONDENCE:—Daffodils in California. *Charles H. Shinn.*	87
Bulb-farming for the South-west. *Lora S. La Mance.*	87
THE FOREST:—Forest Protection.—I. *Gifford Pinchot.*	87
EXHIBITIONS:—Eleventh Annual Exhibition of the Architectural League of New York.—I. *M. G. Van Rensselaer.*	88
American Carnation Society	89
Recent Plant Portraits	89
NOTES	90
ILLUSTRATION:—Viburnum erosum, Fig. 9	85

The Mountains of California.

THE two great mountain ranges of California, united at the north by a transverse and broken mass of high ridges, but otherwise distinct—the Coast Range rising to elevations of from 2,000 to 8,000 feet and composed of innumerable spurs and rolling hills, enclosing many long valleys opening to the sea, and the Sierras separating the great central valley of California from the deserts which extend from its eastern base to the Rocky Mountains—are the predominant features of the state. The Sierras have a total length of five hundred miles, with a width of some seventy or eighty miles, and several of the highest peaks ascend to over 14,000 feet above the sea-level, Mount Whitney, its culminating point, being the highest mountain in the United States, with the exception of some of the Alaska giants. One of the most beautiful of mountain ranges, it possesses extraordinary interest in the history which is printed on its ice-swept pages, and in the forests of conifers which now clothe its slopes; and in the fascinating book whose title appears at the head of this article Mr. John Muir tells this history and describes the forests, their trees, and several of the animals which live among them, speaking out of a full knowledge and with the feeling and affection of a devoted lover of nature. No one has had such opportunities for studying the Sierras, or knows them so well; and no one, it may be said, has done so much to preserve their beauty by securing the establishment of the Sierra Forest Reservations. Summer after summer, with a blanket twisted over his shoulders and a bag of dried bread crumbs and a pouch of tea at his belt, without a gun or any companion but his own thoughts, he has tramped over the whole range, tracing the lines of extinct glaciers and exploring the highest peaks and the most remote and inaccessible gorges; only descending to replenish his scanty stock of food and passing long winters in a hut in the Yosemite Valley in order to become familiar with his beloved mountains and trees in winter as well as in summer. Interesting as is the story which he tells of the gradual modeling of the Sierras into their present form by the action of ice exerted through countless centuries, it is of the Sierra forest and the Sierra trees, of which Mr. Muir has succeeded in drawing pictures of life-like accuracy and remarkable beauty, that we must speak to-day. A paragraph like the following, describing the forests of the central Sierras, which seem to live in the picturesque language of which Mr. Muir is master, is a good example of his method:

Here, too, in the middle region of deepest cañons are the grandest forest-trees, the Sequoia, king of conifers, the noble Sugar and Yellow Pines, Douglas Spruce, Libocedrus, and the Silver Firs, each a giant of its kind, assembled together in one and the same forest, surpassing all other coniferous forests in the world, both in the number of its species and in the size and beauty of its trees. The winds flow in melody through their colossal spires, and they are vocal everywhere with the songs of birds and running water. Miles of fragrant Ceanothus and Manzanita bushes bloom beneath them, and Lily gardens and meadows, and damp, ferny glens in endless variety of fragrance and color, compelling the admiration of every observer. Sweeping on over ridge and valley, these noble trees extend a continuous belt from end to end of the range, only slightly interrupted by sheer-walled cañons at intervals of about fifteen or twenty miles. Here the great burly brown bears delight to roam, harmonizing with the brown boles of the trees beneath which they feed. Deer, also, dwell here and find food and shelter in the Ceanothus tangles, with a multitude of smaller people. Above this region of giants the trees grow smaller until the utmost limit of the timber line is reached, on the stormy mountain-slopes at a height of from 10,000 to 12,000 feet above the sea, where the Dwarf Pine is so lowly and hard beset by storms and heavy snow, it is pressed into flat tangles, over the tops of which we may easily walk. Below the main forest-belt the trees likewise diminish in size, frost and burning drought repressing and blasting alike.

In the chapter devoted to the forest all the principal Sierra trees are described, not in the dry and often obscure language of the botanist, but in the words of a literary artist who has studied them in all their varied aspects; and of all the descriptions of trees which we have read these are the only ones which enable the untraveled reader to form, without the aid of a photograph, a really correct and accurate idea of the appearance of the tree in question. Take, as example, Mr. Muir's description of the Juniper of the high Sierras (Juniper occidentalis):

The Juniper is preëminently a rock-tree, occupying the baldest domes and pavements, where there is scarcely a handful of soil, at a height of from 7,000 to 9,500 feet. In such situations the trunk is frequently over eight feet in diameter, and not much more in height. The top is almost always dead in old trees, and great stubborn limbs push out horizontally that are mostly broken and bare at the ends, but densely covered and embedded here and there with mossy mounds of gray foliage. Some are mere weathered stumps, as broad as long, decorated with a few leafy sprays, reminding one of the crumbling towers of some ancient castle scantily draped with ivy.

Here, in a few words, is a description which presents the living tree to our eyes as clearly as if it was standing before us as we read, and it is this clearness and simplicity in description which seems to us to be the great charm and merit of the book.

Of especial interest are Mr. Muir's studies upon the history, distribution and age of the Sequoia gigantea, one of the most interesting as it is the largest of American trees. The Sequoia grows in a widely interrupted belt from the middle fork of the American River to the head of Deer Creek, a distance of about 250 miles, the elevation of the belt above the sea varying from 5,000 to 8,000 feet. At the north the Sequoia occurs only in small isolated groups, which are sometimes from forty to sixty miles apart, but south of King's River it is not restricted in groves, but extends across the broad basins of the Kaweah and Tule rivers in noble forests for a distance of nearly seventy miles. South of the cañon of the south fork of King's River there is a forest of Sequoias about six miles long and two miles wide. This is the most northern assemblage of this tree that can be called a forest, the very finest being found, however, on the north fork of Tule River. It has long been known that in the northern groves there are comparatively few young trees or saplings, and this fact led to the belief, before the discovery of the southern forests, that the Sequoia was gradually dying out. But in

the southern forests Mr. Muir finds "that for every old storm-stricken giant there are many in all the glory of prime vigor, and for each of these a crowd of eager, hopeful, young trees and saplings growing heartily on moraines, rocky ledges, along watercourses and in the moist alluvium of meadows, seemingly in hot pursuit of eternal life."

The largest Sequoia Mr. Muir has measured is in the King's River forest, and is thirty-five feet eight inches in diameter inside the bark four feet from the ground. Such a tree he believes to be more than five thousand years old. His observations upon the age of the Big Trees are interesting and important. The stump of a tree in the Calaveras grove, when examined many years ago by Professor Asa Gray, showed about 1,300 layers of annual growth, and led him to believe that the reputed age of these trees had been greatly exaggerated. A tree cut in the King's River forest, however, of about the same size as the Calaveras tree, and not very old-looking, Muir found to be 2,200 years of age, while the King's River giant displayed over 4,000 rings in an incomplete section which he was able to examine. "No other tree in the world," he says, "so far as I know, has looked down on so many centuries as this Sequoia or opens such impressive and suggestive views into history." It has generally been believed, too, by naturalists that the Sequoia was once far more widely distributed over the Sierras than it is at present. Mr. Muir, however, has reached the conclusion that it has never been at any time since the glacial period more abundant than it is now, his careful examination failing to reveal a single trace of its previous existence beyond its present bounds. Sequoias, apparently, do not die a natural death, and, barring accidents, appear to be immortal, living on indefinitely unless destroyed by man or fire, smashed by lightning or thrown down by storms or by the sliding down of the ground on which they stand. When one of the Big Trees falls, the trunk, which is practically indestructible by the action of the weather, may remain on the ground for centuries, and when it is finally destroyed by repeated burnings, a great trench, caused by the weight of the falling tree, permanently marks the place where it has laid. Such trenches exist in all the Sequoia groves and forests, but beyond their limits Mr. Muir has searched for them in vain—conclusive evidence, it would seem, that the Sequoia belt has not undergone any great diminution since the close of the glacial epoch.

The Sequoia was probably one of the first trees that obtained a foothold on the Sierras after the ice-sheet began to break up into individual glaciers, and its distribution in isolated groves and forests may be accounted for, as Mr. Muir suggests, by the fact that when it first appeared on the exposed ridges the intervening space was occupied by glaciers. The Sequoia belt, therefore, attained its greatest development at the place where, owing to topographical peculiarities, the ground had been most perfectly protected from the main ice rivers that pour down from the summits long after the smaller local glaciers had melted. Contrary to the now generally accepted theory that the Sequoia which existed in the Arctic Circle during the tertiary epoch reached California from the north, Mr. Muir believes "that as the Sequoia forests present a more and more ancient aspect as they extend southward, the species was distributed from the south, while the Sugar Pine, its great rival in the northern groves, seems to have come around the head of the Sacramento Valley and down the Sierra from the north.

We wish space would permit us to speak of the chapter devoted to the Douglas squirrel, the great Sierra forester, as Mr. Muir calls him, the devourer and incidentally the disseminator of coniferous seeds, and of the other animals and birds whose habits he describes with such delightful freshness; but for these we must refer our readers to the book itself. During the last fifty years a number of books in which nature and natural objects have been discussed in what may, perhaps, be called the poetical method, have appeared. None of them, however, in our judgment, compare with Mr. Muir's production in truthfulness of observation and beauty of expression, and The Century Company has done a useful thing in collecting in a volume these essays on the Mountains of California, which first appeared in slightly different form in the pages of *The Century Magazine*.

The Strawberry in New England.

IT is well known that this fruit has been cultivated for centuries in the Old World, but some misconception seems to exist in regard to the date of the cultivation of the Strawberry in New England, as well as to its abundance in early times. In the last report of the Connecticut State Board of Agriculture, page 66, a member stated that he could not find that the Strawberry was cultivated here in gardens previous to 1824. Dr. Timothy Dwight, in his delightful volumes of *Travels in New England*, published in 1821, though written earlier than 1817, gives a list of five different varieties of Strawberries, four of which he had under cultivation in his garden. He mentions the following varieties: The Red Meadow, White Meadow, Field, Hudson and Hautboy. Dr. Dwight says: "The Meadow Strawberry of this country is the best fruit of the kind which I have seen. It is rather larger than the Chili Sweet, and more prolific. It also improves greatly by culture. I have seen several which were four and a half inches in circumference, many which were four, and bushels which were between three and four." And he further states: "I have cultivated the Wild Meadow Strawberry more than twenty years, and during that time it has increased to twice its original size."

In regard to the Field Strawberry, he says that it "is sweeter, ten days earlier, but much smaller, than the Meadow Strawberry, and has not increased in size by a cultivation of eight years in my garden. The plants become immediately much larger, but the fruit has not been changed at all." He also mentions the Hautboy and Hudson varieties as having been in cultivation for many years in his garden. The former variety is a well-known European form; the latter is a form I am not familiar with, although I suspect it to be an old cultivated variety common in these days. These statements of Dr. Dwight, who died in 1817, show that the Strawberry was in cultivation in New England before the beginning of this century.

He, moreover, states that the Hautboy Strawberry, Fragaria elatior, has been found growing spontaneously in two distinct and remote localities in Connecticut. This statement, if true, would undoubtedly indicate that they were introduced through the agency of birds.

The White Meadow Strawberry which he calls attention to is a mere sport or variety of the ordinary Red Strawberry. It is also mentioned by Dr. Dewey in his *Plants of Massachusetts*, 1890, page 59, as occurring plentifully in the Berkshire Hills.

In regard to the abundance of the Strawberry in early times there appears to be some misconception also. Every one is aware that there are few places in Massachusetts where it would be possible now for one to gather more than a few pints of strawberries in a whole day. In early times, however, when there was more virgin soil than there is to-day in New England the wild Strawberry was very abundant, and frequently grew to a much larger size than at present; and even within the recollection of men now living this fruit was by no means rare in this state, neither is it in Nova Scotia and New Brunswick to-day. William Wood, an early visitor and accurate observer, states in his *New England Prospect*, published in 1635, that "there is likewise growing all manner of Hearbes for meate and medicin, and that not onely in planted Gardens, but in the woods, without either the art or helpe of man. . . . There is likewise Strawberies in abundance, verie large ones, some being two inches about. One may gather halfe a bushell in a forenoone." And in 1643 Roger Williams wrote: "This berry (Strawberry) is the wonder of all the fruits growing naturally in those parts; it is of itself excellent, so that one of the cheiftest doctors of England was wont to say that God could have made, but never did, a better berry. . . . In some parts, where the natives have planted, I have many times seen as many as would fill a good ship within a few miles' compasse. The Indians bruise them in a mottar and mixe them with meale and make Strawberry bread." Strawberry bread appears to have been in common use among the Indians, as we find it mentioned by other writers, notably Gorkin, who was a co-worker with Rev. John Eliot among the Nipmucks and other Massachusetts tribes. These statements, with many others which could be cited, show conclusively that the wild Strawberry was once very abundant here in New

England, and undoubtedly the principal reason for the decline of this wild fruit is the exhaustive conditions of our soil. In early times the clearing of an old wood gave rise to abundance of these berries, and they were noted as being abundant in our meadows. The Strawberry, however, is not the only natural crop that has changed. Many of our meadows, which now produce a crop of grass hardly worth cutting, once supported a luxuriant growth of the Fowl Meadow Grass, "thick and long, as high as a man's middle, some as high as the shoulders, so that a good mower might cut three load a day." To-day, however, hardly less should be expected, since for generations crops have been removed from the soil without the return of any plant-food, whereas in olden time, before the advent of the white man, everything was allowed to decay where it fell, which meant a considerable yearly increase of organic matter to the soil.

Agricultural College, Amherst, Mass. *G. E. Stone.*

Foreign Correspondence.

Orchids at Kew.

A HAND-LIST of Orchids cultivated in the Royal Gardens, Kew, has just been issued and may be obtained from the Curator, price sixpence. This is the fourth of the series of catalogues of the Kew collections of living plants printed within the last two years, the other three being part I. of the hardy trees and shrubs, Ferns and Fern allies, and hardy herbaceous and alpine plants. The intention of the Director is to catalogue the whole of the collections of living plants at Kew, the total number of species being estimated roughly at twenty thousand. A list of the conifers is already in the printer's hands, and this will be followed by the second part of the hardy trees and shrubs.

These lists are of horticultural value because, while they comprise a large number of species of more or less interest to botanists, they also include practically all the plants cultivated in gardens for ornamental or economic purposes. No pains have been spared to make the nomenclature accurate and in accordance with the views of recognized authorities. Many garden names are reduced as synonyms or errors, but through lack of sufficient material or information some which are provisional have been retained. The author of the name, habitat of the plant and, where possible, a reference to a published figure are given with each species. The value of these lists must be evident to any practical horticulturist who has to deal with large collections and to whom the almost hopeless confusion of names by dealers and others must have often presented difficulty. By dealing thus thoroughly and comprehensively with the whole of cultivated plants, Kew has rendered great service to horticulture, whose followers, it is to be hoped, will adopt the names preferred by the Kew authorities and thus bring about uniformity where, till now, there have been confusion and doubt.

The Orchid list enumerates 200 genera and 1,800 species (including about fifty garden hybrids) as being represented by living examples at Kew. The greater proportion of these are what are popularly known as botanical curiosities, which would not find favor with those who are interested in beautiful flowers, but which, nevertheless, are worth a place at Kew, where the main object is botanical, and to represent the order in as comprehensive a way as possible. As an example I may cite the genus Pleurothallis, of which there are forty species at Kew, but not more than half a dozen of them would be looked at a second time by the ordinary collector. The genus Bulbophyllum is represented by sixty-four species, Cirrhopetalum by thirty-one, Angræcum by thirty-nine, Dendrobium by one hundred and forty, Masdevallia by eighty, Oncidium by one hundred and eight species, and so on.

This collection has been slowly built up in various ways, partly by purchase or exchange, partly through the kindness and interest of travelers and residents in countries where Orchids abound, and by the generosity of some of the collectors and cultivators of Orchids in this country. Many of the plants are small, perhaps obtained from a scrap taken from a specimen sent to the herbarium for identification, all such that come into the Kew net being good fish.

The introduction to the hand-list contains some interesting information about the Kew collection in particular, as well as about Orchids in general. The accommodation for Orchids at Kew is not first-rate, only two houses to which the public are admitted being available for their display, and these are so ill-adapted for the cultivation of Orchids that they are practically only show-houses in which the plants are placed when in flower. The bulk of the collection is grown in some half-a-dozen small houses to which the public cannot conveniently be admitted. It would, however, be possible to provide houses which would be suitable for the culture of Orchids, and to which the public might have free access.

Orchids have been continuously cultivated at Kew from their earliest introduction into this country. The varied fortunes which have attended the collection practically reflect the history of the progress which has been made in the art of growing Orchids under artificial conditions.

The first exotic Orchid which was introduced into English gardens was Bletia verecunda, which was obtained from Providence Island, Bahamas, by Peter Collinson, in 1731, and flowered in the following year in the garden of Mr. Wager. About the year 1778 Phajus grandifolius was imported from China by Dr. Fothergill, and a full-sized colored figure of it is given in the first edition of the *Hortus Kewensis* under the name of Limodorum Tankervillæ. A peculiar interest attaches to this plant because it was in it and at Kew that in 1802 Francis Bauer, who was "resident draughtsman for fifty years to the Royal Botanic Garden," discovered and figured the "nucleus of the case," an all-important body, the first description of which was published by Robert Brown in 1833.

In the first edition of Aiton's *Hortus Kewensis* fifteen non-British species are enumerated as cultivated at Kew. Sir J. E. Smith wrote: "We have scarcely seen any one species of this genus (Epidendrum), except in a dry state, before the year 1787, when E. cochleatum flowered at Kew, nor was it till October, 1782, that E. fragrans, of Swartz, exhibited its rich and elegant bloom in the same rich collection. At present several species are to be seen flowering in the spring and autumn."

In the second edition of the *Hortus Kewensis* (1813) 115 species are enumerated, of which eighty-four are exotics belonging to thirty-nine genera. In 1848 the number of species cultivated at Kew had increased to 755, and in 1872 the number of species and varieties was 851, belonging to 138 genera. Since then the collection has grown steadily. The collection of Orchids in the botanic gardens at Glasnevin, Dublin, is almost, if not quite, as rich in species as that at Kew.

The essential cultural requirements of Orchids were not known till long after they had attracted the attention of horticulturists. It is interesting to note the struggles of our great-grandfathers to discover the conditions most suitable for them. We who know all about it are surprised that any intelligent cultivator should have tried to grow epiphytic plants "in common soil in pots plunged to the rim in a tan bed." Teak baskets, sphagnum moss, peat fibre and charcoal appear to us to be exactly what any intelligent schoolboy would have recommended as supplying the right material for an epiphyte. But, like all useful discoveries and inventions, simple as they appear to us, they were not worked out without much thought, experiment and the sacrifice of many plants. One of the shrewdest of botanists working in the van of the horticultural art of his time, Dr. Lindley, stated in a paper read to the Royal Horticultural Society in 1830 that "high temperature, deep shade and excessive humidity are the conditions essential to the well-being of Orchids." Thirteen years later another Orchid authority, Mr. Bateman, recommended the same treatment, adding that a resting season was necessary. This treatment became the only orthodox one, and was persisted in for upward of thirty years.

Two men, however, broke away from the current tradition, and with conspicuous success. One of the first of these was Joseph Cooper, gardener to Earl Fitzwilliam, at Wentworth (1835). A still bolder innovation was adopted shortly afterward by Paxton, at Chatsworth. In both cases the essential innovations were lower temperature and increased ventilation. The old tradition still, however, held its ground; plants perished under the barbarous treatment they received in the hot-houses of this country almost as fast as they were imported. To such an extent were the losses felt that Lindley, in a remarkable article published in *The Gardeners' Chronicle* toward the end of 1859, pronounced their treatment "a deplorable failure," and which Mr. Bateman also some years later characterized as "incredible folly."

Even within the last twenty years considerable advance has been made in the art of Orchid culture. We now recognize that fresh air at all times is essential, that many Orchids enjoy bright sunshine, that while some require plenty of moisture all the year round, others require it only for a portion of the year, and that some even thrive only when treated as if they were Cacti. The temperature for exotic Orchids varies from a purely tropical to that of a few degrees above freezing point, and while some species during growth are kept in a hot steamy atmosphere, and after growth is completed are removed to comparatively cool and dry conditions to afford them a rest, others suffer if the conditions are not fairly uniform all the year round.

London. *W. Watson.*

New or Little-known Plants.

Viburnum erosum.

THIS is one of a small group of North American and Asiatic Viburnums whose leaves are furnished with small linear stipules. It is a stout shrub five or six feet in height, with slender much-forked branches covered with orange or reddish brown bark. The leaves are oblong-ovate or oblong-obovate, acuminate, gradually narrowed, wedge-shaped and often unequal at the base, erose-serrate, with slender spreading rigid teeth, stellate-pubescent, membranaceous, dark yellow-green on the upper surface and pale and rather lustrous on the lower, and rusty-pubescent on the under side of the thin midribs and in the axils of the remote primary veins; they are from two to three inches in length and from an inch to an inch and a half wide, with stout pubescent petioles about a quarter of an inch in length. The flowers appear in May in lax pubescent long-stalked corymbs about three inches across, with linear-lanceolate scarious reddish bracts and bractlets. The corolla is rotate and greenish white, with rounded lobes about half as long as the stamens. The fruit is red, with a flat stone, slightly thickened and obscurely two-ridged on the back, and furnished with a short mucro at the apex.

In Japan Viburnum erosum inhabits the southern island of Kiushiu and southern and central Hondo, where it is not rare at elevations of three or four thousand feet above the sea in the mountain districts crossed by the Nakasendō; it also inhabits Formosa, southern and central China and Corea.

Viburnum erosum* has been cultivated in the Arnold Arboretum since 1880, having been received in that year from the Parsons' Nursery in Flushing, Long Island; and the flowering branch in the illustration on page 85 of this issue is from a specimen grown in the Arboretum; the fruit represented on the plate is from a wild Japanese specimen. Of considerable interest botanically, Viburnum erosum is less desirable as an ornamental plant than several of the North American and Japanese species now to be found in gardens. *C. S. S.*

* Viburnum erosum, Thunberg, *Fl. Jap.*, 124 (1784).—De Candolle, *Prodr.*, iv., 327.—Maximowicz, *Mél. Biol.*, x., 666.—Franchet & Savatier, *Enum. Pl. Jap.*, i., 200.—Hemsley, *Jour. Linn. Soc.*, xxiii., 351.
Viburnum erosum, var. Formosanum, Hance, *Ann. Sci. Nat. sér.* 5, v., 216 (1866).
Viburnum dilatatum, B. Formosanum, Maximowicz, *l. c.*, 666 (1880).

Cultural Department.

Vegetable Notes.

ALTHOUGH the cultivation of Cucumbers during the winter months is somewhat troublesome, they are comparatively easy of management during the longer and brighter spring days. Plants from seeds sown at the end of February will give a supply of fruit from about the middle of April until plants outside begin to bear. The starting of seeds is sometimes troublesome on account of damping off just after germination has begun; this can be prevented by careful planting. A little study of the habit of the seed will show that the embryo breaks through the shell at the point or thin end, the root being first produced. The seeds should be set so that the root can go directly down into the soil and the top shoot upward. If the seeds are sown at random the little plant, after germination, is sometimes in a position from which it cannot extricate itself. They should be sown in small pots in a light sandy soil and placed in a good bottom-heat; as soon as the plants are up they should be removed to a light situation near the glass, but shaded from strong sunlight. They must be shifted into larger pots as soon as they are strong enough, using a heavier soil than before, and which the roots will now be able to take hold of. When planted into their permanent quarters a few tobacco-stems spread about will help to keep off the black fly, which is always a ready enemy. It is necessary to keep the atmosphere moist and to syringe twice daily on bright days, but the syringing must be done lightly, as the leaves are tender and easily damaged. On this account smoking should never be resorted to as a means of destroying the fly, but if this pest becomes troublesome fresh tobacco should be spread over the pipes and sprinkled with water. This should be done when the pipes are warm and the house is closed. A night temperature of sixty degrees is sufficiently high, with a rise of fifteen degrees through the day. The plants may be slightly shaded to advantage when the sun is bright. We have tried several varieties, but find none equal to Telegraph for quality, productiveness and free growth.

A sowing of Cauliflower seed for frame work should be made toward the end of February, and the last batch should be planted indoors. It is not advisable to plant indoors any later, as the bright sunlight proves too much for them after the beginning of April. No matter how carefully they are watered and aired after that date the plants will flag on bright days. This flagging has the effect of injuring the quality and reducing the size of the head, and also induces a number of heads to come hard and open and unfit for table use. While in frames the plants are not subjected to the same drying influences and can have more air by removing the sashes during favorable weather. If the soil in the frames has already been used for a similar purpose, about a foot of it should be removed and replaced with well-enriched fresh soil. For this, as for greenhouse work, the dwarf varieties, such as Snowball and Dwarf Erfurt, should be chosen, since they give the best returns in the least space.

Sowings of Boston Market and Tennis Ball Lettuce should be made in flats for planting in frames later on, and of Golden Queen for indoor work. We find this latter variety resists heat better than any we have yet tried and can, therefore, recommend it to keep up the supply. During the winter months it can be grown at a night temperature of fifty degrees, while such varieties as Rawson's Hot-house and Boston Market do better ten degrees lower. The latter varieties would probably take from ten to twelve weeks to mature, while Golden Queen, at a night temperature of fifty degrees, can be had fit for use in eight weeks from the time of sowing. It also does well at a lower temperature, though the growth is correspondingly slower, and it is questionable if it pays to maintain a high temperature for Lettuce during winter, except in cases of emergency.

Early Warwick and Red Valentine Bush Beans still prove the most suitable varieties. Successive sowings may be made in benches or in pots. They are convenient in pots during the spring months, as they can be shifted about to economize space in the benches. The Beans are sometimes hard to start for lack of bottom-heat, but the pots can be set directly over the pipes, and if kept well supplied with water the seed comes up quickly. Ten-inch pots are a convenient size. They should be only two-thirds filled with soil when the seed is sown, the other third being added after the plants are large enough to permit of it. Five or six plants are enough to a pot of this size, but it is better to sow plenty of seed and thin out after the strongest plants can be selected. If subjected to a dry atmosphere red spider is apt to be troublesome, but syringing may be freely practiced, and this will help to keep the plants clean. A light situation and full exposure to sunlight suits them best.

Tarrytown, N. Y. *William Scott.*

Seasonable Notes on Chrysanthemums.

WITH the distribution of new Chrysanthemums we may say the season of these flowers for 1896 has commenced. With the watchful cultivator it has never ended. When the last flowers are cut we gather our stock for the coming season, study notes, and secure what we can of the new varieties which have impressed us favorably when visiting our neighbors and at the exhibitions. As often happens, the stock of some varieties, much sought after, is limited, and so we are propagating and growing all winter long. The bulk of our stock plants are yet in cold frames. They have not been frozen during this uncommonly mild winter, so that cuttings have been taken as needed. It is only during recent years that we have come to pay due attention to our stock during what may be termed the resting season. It has been too much the custom to shove the plants under benches and pay little or no attention to them until they were needed. We were certain in this way of some sort of cuttings, but experience has proved that it is advantageous to have our stock hardy, healthy and exposed to air and sunshine on every available opportunity. Some growers now even take the trouble to grow plants in the open garden exclusively for stock.

As stated in previous notes, our plants intended for specimens were started a month earlier than usual, and we have lately moved them into six-inch pots. Ordinarily we should now have them in four-inch pots. In this stage they would be early enough for all practical purposes and would make quite large specimens. Some English growers start plants in December and grow on old plants which have been cultivated the season before for specimen blooms. I have tried this plan, but with indifferent success. Young plants taken as cuttings, when old plants were started, outgrew them in four months, which is only about half a season's growth. I am told that one gardener, following the English practice, grew some plants all last season for the sole purpose of making specimens of them this. It is to be hoped that these plants will be exhibited, so that we can have an opportunity of judging between the English and American methods.

Experience shows that cuttings root better during the month of March than at any other time. Later, as the sun gains power, the air grows drier and closer attention must be given to the work of propagation. Indeed, I am acquainted with good gardeners who have been unable to understand why they lost a large percentage of cuttings during the late spring months. During the months of May and June a close, well-shaded propagating frame is essential, and complete saturation for the first four or five days. It is hard to remedy the results of exposure even for a few hours, except in moist weather, or evening and early morning. The value of new varieties has almost invariably been estimated with a view to specimen blooms, and judges have never required that exhibitors of such varieties should show growing plants. It has, therefore, been with difficulty that those interested in specimen plants have been able to select such as are useful for their purpose among novelties. But, so strong is the desire to be abreast of the times, that in nine out of ten places one visits he will find growers relying on untested novelties and discarding many available varieties which have been tried and found suitable. I have done this myself. Due credit, however, is always given

Fig. 9.—Viburnum erosum.—See page 84.

to novelties shown in first-class condition, so that, while not relying upon them, we always grow to the best advantage such as are most promising. Our list of varieties suitable for specimen plants has been made with care, and, although extending over a number of years, is by no means large. Practical experience must alone guide, and when looking over the lists I often see kinds noted as suitable for specimen plants which have not proved so with me. To give an idea how few plants are really suitable for this purpose I will say that Crystalina, a dwarf early white, and Mrs. S. T. Murdock, pink, were the only real good ones found among all the introductions of 1895. The most promising varieties for 1896, so far as I have seen, are Mrs. Perrin, pink; Gretchen Buettner, white; Violescent, blush, and Columbine, bright bronze, the latter being especially recommended.

It has been said that the popularity of the Chrysanthemum is on the wane. No doubt, the Japanese varieties have been overdone, but that the Chrysanthemum will ever become unpopular I do not believe. There will rather be a return to a larger variety of types, and many of the old kinds will come into favor. Already we see this. We shall see more pompon-flowered varieties grown as pot-plants. They are handsome in all sizes and shapes, and, being naturally bushy in habit, are less formal than trained specimens; they are nice, too, for cutting in sprays. Anemone-flowered varieties have a beauty all their own. They do not mix well with the large Japanese or formal Chinese sorts, but they supplement them, and small plants are very effective in grouping, far more so than the large-flowered varieties.

Varieties fresh from the introducers usually come with the balls of earth pressed closely about the plants. I find it a good plan to carefully loosen the soil by gentle pressure before placing them in new soil. Of late years, mainly for want of space, I have put mine in flats, with plenty of room for branching, placing them on shelves near the glass. Here they make good stocky plants. I take the tips off as soon as the plants become hardened, and root them. These often make better plants than the original stock. Such varieties as I wish to grow solely for specimen blooms I cut in hard. This encourages shoots of the sucker type, and these make the very best cuttings. Leaf-eyes of any exceptionally rare variety, such as Philadelphia was last season, or Mrs. Perrin will be this, may be rooted quite as easily, and some of the finest blooms have been raised in this way.

Wellesley, Mass. *T. D. Hatfield.*

Pentstemons.

THE old-fashioned border flowers are no longer so carefully tended as they once were by the specialists, and it is a rare thing now to find a good collection of Tulips, Auriculas, Carnations or Picotees. In the old days the number of plants in cultivation was small in comparison to what it is to-day; the limits of horticulture were circumscribed for those of moderate means, and the result was that these classes of plants were taken in hand by enthusiasts who became identified with one or more of each and made a close study of them, with the result that they were improved to the utmost limit, and there are no better kinds to-day than there were a generation ago. The old-time exhibitions have largely died out, too; many, if not most, of the plants formerly displayed it would be impossible to obtain now. This must not be considered a retrogression altogether, but rather an indication that gardening is too broad a subject to be restricted to exhibition limits, and border Carnations, Tulips, Auriculas and Pentstemons are grown now to be enjoyed in the garden instead of on the show board with the regulation frilled white paper collars round each bloom.

It is more especially of the Pentstemon that I wish to speak as I saw it at its best in English gardens last August. At Kew especially, in the public parks and everywhere in home gardens, large beds were devoted to them, and the colors were as brilliant as those of Gladioli, and with about the same range of colors, too, but with more elegantly shaped flowers. The flowers were as large and the spikes as tall as well-grown Foxgloves, and admirably adapted for house decoration when cut. The season of bloom, too, lasted for two months I was told, and it seemed there were few plants that could give such returns for so little trouble. When asking about the sorts I was told that they were in all cases seedlings raised from a sowing made early in the year and set out in summer, the plants being treated as annuals instead of perennials; in this way winter storing was dispensed with. Seed was saved from the best flowers each year for the display to follow. Now, it at once occurred to me that the progenitors of this race of garden Pentstemons are all north-western American plants, the dominating blood being that of Pentstemon Hartwegii, its brilliant scarlet being very evident, while the more sombre purples and blues were derived from P. Coboca and others. As now grown, however, they are distinct enough in themselves to lose any identity with any particular species.

There seems to be no reason why we cannot have beds of these fine border flowers as easily as they are obtained in Europe. There may be cultivators of Pentstemons here, but I have not seen them. Here we have made a start in the right direction by securing seeds from several sources and the plants are well up now; the results will be noted later in the summer, but there seems to be no reason to doubt that the experiment will be a success.

South Lancaster, Mass. *E. O. Orpet.*

Warming Tanks for the Victoria regia.

DURING the past season the Victoria regia was grown most successfully in some of our public parks and gardens for the first time, and excited much interest in aquatic gardening. Where the Victoria can be grown well it is always a surprise to those who are not familiar with it, and every one is impressed with its queenly rank among Water-lilies. To secure a perfect specimen it is necessary to have an artificially heated tank, for our season is otherwise far too short. The plant cannot be safely set out until settled warm weather, or about the end of June or beginning of July. With continuous summer weather the plant attains only fair proportions when cool nights and shortening days are upon us, but with artificial heat a tropical temperature can be maintained for six or eight weeks before warm weather sets in, and the plants will have reached good proportions and be a source of enjoyment throughout the summer months. Few plants are grown entirely under glass during the whole season, although there are advantages in such treatment. It is much more enjoyable, however, to inspect these marvels of the tropics in the open air rather than under a glass roof in summer's heat.

Plants for the open-air pond or tank should have attention now. The seeds may be sown any time before the second week of March in water kept at a temperature of eighty-five to ninety degrees, Fahrenheit. They will germinate in about twenty days. The plants make rapid growth and will require repotting at intervals before becoming pot-bound or exhausted in small pots. If this detail is attended to the plants will make satisfactory growth and be of the first size for planting out when the season arrives. The plants should be kept steadily growing from the seed-leaf to the mature plant. The matter of heating tanks for Victoria regia and for other tropical aquatics has received attention from many cultivators since the Victoria was first introduced. Several systems, more or less satisfactory, have been adopted, but I feel sure that the best and most satisfactory has yet to be adopted. If a system of hot-water heating is already in use in the establishment, it is advantageous and economical to adopt this for heating the tank. But a long stretch of piping in one tank is not practicable, as the heat is soon given off and a great portion of it is therefore useless. I have used hot water under pressure for heating tanks in connection with the greenhouse plant, and found in shallow tanks, eight inches deep, that one one-inch pipe through the centre of the tank is as effective as a one-inch flow and return pipe through the same. The return pipe is cold almost always, except during hard firing in severe weather in winter. Steam-heating in the ordinary way is to be condemned. It is unreliable, unsteady and dangerous, and needs constant and careful watching. At the point of contact, where the steam-pipe enters the tank, the water will be very hot, the steam condensing as soon as it enters the submerged pipe, and little heat is conveyed a few feet farther along. Consequently a tank twenty feet long would be very hot at one end and many degrees colder at the other. Having recently had a house one hundred feet long fitted up for aquatics and heated by steam, I endeavored to have a large tank heated by the same system, and to overcome the difficulties mentioned I selected a two-inch pipe to run through the centre of the tank on the floor. Through this pipe the steam-pipe (one inch) was conveyed, making the ends of ingress and egress perfectly water-tight, and thus forming an air space between the steam-pipe and the radiating surface of the two-inch pipe. By such an arrangement the steam-pipe at no time comes in direct contact with the water, and the air space is uniformly heated through the entire length. The water in the tank is also uniformly heated and an even temperature is maintained. This plan obviates the objections to the ordinary steam-pipe submerged, and it is the best method I have found for warming the water in Lily-tanks by steam-heat.

Riverton, N. J. *William Tricker.*

Correspondence.

Daffodils in California.

To the Editor of GARDEN AND FOREST:

Sir,—It is probable that more Daffodils are in bloom now (February 1st) on the farm of James Shinn, near Niles, Alameda County, than can be found in all the rest of the state put together. The original stock was imported about thirty years ago by the late E. P. Sanford, of Oakland, a prominent druggist, whose garden was for many years one of the notable features of that town. When the growth of Oakland made the sacrifice of the garden necessary, part of the stock of Daffodils, then greatly increased, was taken to Niles, and received a judicious amount of neglect for many years.

At the present time the Daffodils have taken possession of a large part of the available garden area. They are allowed to grow in clumps for five or six years without separation, and then it becomes necessary to extend the plantation further and further into the surrounding orchard. The surplus flowers are sent to San Francisco for sale, and the following items from the beginning of the present season will serve to show how well suited the climate is for this flower:

Three dozen flowers were shipped as early as January 17th; by the 24th the daily cutting was thirty-five dozen, and by the 31st it had reached 300 dozen, with the supply still increasing and destined to continue for several weeks.

We have been trying to identify the leading variety represented here. Ninety-nine out of a hundred flowers are a large, firm, rich-colored, single Trumpet Daffodil, much resembling the Ard Righ, though earlier; at least, earlier than imported Ard Righ bulbs when planted alongside of them. We have planted a good many named varieties which may develop better qualities in course of time, under the favoring conditions, but at present nothing among the yellow Trumpet varieties is equal to our own stock in earliness or excels it in general effectiveness.

As a rule, Trumpet Daffodils bloom here under open-air culture by the middle of January. The Paper-white Narcissi are in bloom by December 1st, and often a fortnight earlier. They are still blooming (February 1st), while the Trumpets are approaching their prime. A few double Trumpets are now in bloom, but the majority will not appear for a fortnight or more, and, in fact, the double forms of the Medii-coronatæ group are not at all prominent until the single Trumpets have gone. Various types of the Polyanthus Narcissus are naturalized in large clumps in the shrubbery, as are many others of the true Daffodil sections, but none of the clustered Narcissi seem quite as much at home as do the single Trumpet Daffodils.

Niles, Calif. *Charles H. Shinn.*

Bulb-farming for the South-west.

To the Editor of GARDEN AND FOREST:

Sir,—Recent experiments indicate that certain favored sections of this country are as well adapted as Holland to the production of an extra quality of bulbs, and this is a matter worth investigating since America imports these bulbs by the million every year. Here and there through the south favorable reports have been made. In particular, Professor Massey, through the columns of GARDEN AND FOREST, has called attention time and again to the possibilities of North Carolina in this direction. The South Ozark region, in my opinion, is another promising field for bulb-growing on a large scale. This region, according to a recent isothermal map, consists of about three tiers of counties, five or six of which are in south-western Missouri, and ten or twelve in north-western Arkansas, together with a strip of Indian Territory adjoining them. From the greater height of the mountains and the different slope of the ranges this belt of land has a warmer climate than the country to the north, south and west of it, and the conditions of local rainfall are much modified also. The distinctions of soil are even more marked. Although rough and broken, it has a peculiar quality that produces remarkably fine fruit. This is the country which sent out the big red apples to win the world's prize and make Arkansas famous at the Columbian Exposition.

This same quality of soil produces as noticeable a development of bulbous plants. Except Hyacinths and Crocuses, which, while they do not really run out, do only fairly well, other spring bulbs multiply so rapidly and grow so large as to suggest competition with Holland. Tulips, particularly the later sorts, increase wonderfully, and the bulbs are large and plump. But, above all, this is a paradise for Narcissus. Six undersized bulbs of one of the varieties of the Incomparabilis section were planted nine years ago, and lifted last fall, when their increase nearly filled a half-bushel. More than that, many of the bulbs were larger and heavier than any imported ones I ever saw. Impressed by the fine appearance of Ozark-grown bulbs, I have for several years tried various members of the Narcissus family for forcing, and can say positively that they are all excellent for this purpose. I have tried the Polyanthus varieties only slightly, but they promise well also, and seem to show no sign of tenderness.

Summer bulbs also do exceedingly well in this same region. Gladioli and Tigridias produce bulbs, or corms, of prodigious size, and whereas eastern growers complain that their largest bulbs of Gladiolus do not give as fine flowers as those of smaller size, the larger our bulbs grow the longer are the flower-spikes and the larger the individual flowers. It would seem that a Gladiolus or Narcissus farm might prove a paying venture here.

Pineville, Mo. *Lora S. La Mance.*

The Forest.

Forest Protection.—I.

The fourth volume of Dr. Schlich's *Manual of Forestry* deals with the very wide subject of Forest Protection. It is a translation and an adaptation of *Der Forstschutz*, by Dr. Richard Hess, Professor of Forestry in the University of Giessen, by Mr. W. R. Fisher, of the English Forest School at Cooper's Hill. Mr. Fisher has improved upon Dr. Hess, not only by a very important addition from his Indian knowledge of forest subjects, notably with respect to forest fires, but also by drawing from the resources of French literature on the subjects of torrents and dunes, and by adding the results of the more modern research on the constitution of woody plants from the works of Robert Hartig. The result is a thoroughly practical book, peculiarly distinguished by the range of experience made tributary to its pages. It has the further conspicuous merit that the translation does not continually suggest the German phrase behind it, but, on the contrary, is uniformly simple and direct. This use of English construction is especially gratifying because of the striking contrast it offers with other recent translations from German works, in some of which the English is so involved and distorted by the retention of the German structure of the original as to be almost unreadable.

"Forest Protection," so runs the definition, "has for its object the security of forests against unfavorable external influences, as far as lies within the power of their owners," consequently the whole subject of forest law is outside the range of the present treatise. Within the boundary thus defined the attempt is made to lay the foundations of successful forest protection through a knowledge of the phenomena and causes of all possible damage, of all preventive and remedial measures, and of how to apply them. More than in any other similar book with which I am acquainted, the attempt has been made to facilitate original and independent study and decision by furnishing a sufficiently wide basis of acquaintance with the causes of injury.

Following upon the definition of Forest Protection and the description of its position in forestry there is a very brief and interesting notice on the historical development of Forest Protection, which traces it back to the religious care of sacred trees in groves. Later on forests were protected chiefly as the resting-place for wild game. A curious illustration of this point of view is contained in John Manwood's black-letter *Treatise and Discourse of the Lawes of the Forrest*, published in London in 1798, which is, I believe, the earliest English book on the subject. On page 15, which lies before me, he says:

And hereupon the Latinests haue framed this latin woord, Foresta, for a Forrest, being compounded of those two woords, fera, and Statio, so that Foresta est ferarum Statio, which is, that a Forrest is a safe abyding place for wild beasts. And euen according to the same manner, immitating the Latinests, we haue framed this English woord, a Forrest, being compounded of these two woords, For, and Rest: And because a Forrest is a safe abyding and priuiledged place for

the king's wild beastes for rest, which two woords (For and Rest) being put together and made one woord, is Forrest, or a Forrest, taking his name of the nature of the place, which is priuiledged by the king for his wild beastes, to have their safe abyding in for rest.

It should be added that a more recent philology derives the word "forest" from the Latin "fores," meaning "out-of-doors." But, although we have discarded Manwood's definition, both of the word and the thing it denotes, the traces of the view he represents still remain in the Scotch "deer forests," which often do not contain a single tree. Nor will it be apt to disappear even in this country while great game preserves, such as the Yellowstone National Park, continue to be of like conspicuous public service.

The question of boundaries, with which the book proceeds, is of comparatively little interest to us, because forest boundaries, such as are here in question, do not exist in the United States; but the second chapter, which deals with protection against avoidable damage in the use of the forest, is of direct value. The sections on bad felling and careless conversion are full of excellent practical advice, and, with a few additions and subtractions, would be models for use in this country. Among others less applicable the author recommends the following precautions, which are not only germane, but are deserving of widespread use in this country:

Measures for the prevention of mischief are: (1) Employment of competent and trustworthy woodcutters, and careful supervision of their work. It is generally advisable to employ the same men year after year, and to withdraw from the gang all those who fell badly, and encourage the best men by instruction and higher wages. (2) Throwing trees on to bare spots and not among young growth. (3) Careful felling of coppice with sharp instruments and with a clean and sloping cut. (4) Avoidance of throwing felled trees on to rocks, stones or other stems; felling uphill or sidewise, so that there may be a minimum of breakage.

Forest pasture is another practical matter intimately connected with the needs of forestry in the United States. Speaking of the damage done by goats the author says:

To take some out of the many instances of the destruction of forests by goats: In the Tyrol and southern Switzerland, and in the Himalayas, fine forests have been completely destroyed by them, and in Ajmere and Merwara, whose hillsides, where vegetation once flourished, have been laid almost bare, with nothing left but deformed, thorny shrubs. In France, since 1665, goats have been excluded from all forests managed by the State Forest Department, and no legal right can be enforced to graze goats in private forests, as the grazing of these animals is considered incompatible with the maintenance of the underwood.

It is true that conspicuous damage on a large scale has, so far, been done in the United States only by sheep, and that notably on the Pacific slope. Similar damage, longer continued, and, therefore, with far worse consequences, has taken place in the Alps of southern France. To this the writer does not refer, but the extent to which the summer pasturage of sheep was carried there may be gauged by the fact that flocks of fifteen to twenty thousand head were frequently driven into the mountains from the lowlands. Monsieur Boppe, the present Director of the French Forest School, mentioned in a lecture which I had the pleasure of hearing that one flock, which he had himself seen, occupied seventeen hours in passing over a bridge thirteen feet wide.

The third chapter, on Forest Offences, has only a potential interest here, and the same is true of the chapter on Forest Servitudes. It will be an enormous advantage when Government forest management comes to be introduced, that rights of user cannot accrue on the public lands of the United States. In India, on the contrary, nearly all of the Government forests were at one time burdened with these rights. At present they have been settled (which does not at all mean extinguished, but only limited and defined) on about 80,000 square miles of Government forest-land, while 50,000 more are still under settlement. With an annual budget of about eighteen million rupees, Mr. Ribbentrop, the present Director General of Forests to the Government of India, estimates that the cost of prescriptive rights to the Forest Department is at least equal to that of its whole establishment. Yet, in spite of this fact, the forests yield an increasing net annual revenue, which now amounts to nearly three million dollars.

New York. *Gifford Pinchot.*

Exhibitions.

Eleventh Annual Exhibition of the Architectural League of New York.—I.

POSTERS and book-covers, jugs, curtain-poles, hat-racks and burnt wood table-tops are not things of the highest intrinsic importance, and they have but the slightest connection with architectural art; yet, in this architectural exhibition, scores of things of these and similar kinds, and of designs for such things, have good places on the well-lighted walls of the galleries, while a series of very interesting park and garden designs, including some of the most important of Mr. Olmsted's recent works, are consigned to the walls of the entrance corridor, where they cannot be seen at all until the approach of evening commands artificial illumination. Moreover, while all the hat-racks and the poker-work and the American designs for Chinese rugs are carefully paraded in the catalogue, it makes no mention whatever of these valuable designs in the corridor. The Architectural League's Hanging Committee and Catalogue Committee seem to have united to declare what has often been said by outsiders—that almost every one in America knows the value of landscape and garden art better than the architects, who ought to be the foremost celebrators of its importance. Certainly the League cannot complain if the practitioners of this art refuse to contribute again to its exhibitions.

The most interesting thing in the whole exhibition, to the general public, and the most instructive, were it properly displayed, would be Mr. Olmsted's scheme for the permanent disposition of the quondam Fair Grounds at Jackson Park, in Chicago. It is a masterly piece of work in conception and in execution. The good sense, the imaginative force and the artistic skill shown in remodeling the features of land and water and the architectural elements bequeathed by the Fair, and forming them into a coherent, varied and beautiful lake-side pleasure-ground, are as great as those that were shown by the original transformation of a desert swamp into a sumptuous place of palaces. This design will soon be reproduced in the pages of Garden and Forest.

Among the other designs by Mr. Olmsted and his associates which have been relegated to the corridor's outer darkness are those for the grounds of Biltmore, Mr. Vanderbilt's place in North Carolina; for Auldwood, Mr. Hoagland's place at Seabright, on the sandy New Jersey coast; for Bleak House, Mr. Winans' place on the rocky shores of Newport; for Mr. D. Willis James' inland place in New Jersey; for the grounds surrounding the mansion which Mr. Hunt built for Mr. Ogden Goelet in the heart of Newport; for the grounds of Washington University, at St. Louis; for Seneca Park, in Rochester, and for South Park, in Buffalo. These form a remarkable series of varied works, showing many types of garden and park design from the almost strictly formal treatment appropriate on a small Newport place, where the house is an adaptation of a stately French château, to the markedly naturalistic treatment befitting a site like that of the Rochester Park, where water plays almost as prominent a part as land in the general effect. Had they been displayed as they should have been, conspicuously, in some position of especial honor, the League would have shown that it understood the meaning of art in the noble sense of the word, and realized the intimate relationship between gardening art and architectural art, and the public would have been interested and instructed as we cannot hope will now prove to be the case.

When the architectural designs in the galleries are studied the action of the two committees seems all the more inexplicable; for they reveal among our architects a growing sense of the need for gardening art in connection with all buildings which do not stand upon crowded city streets. Chief in importance, perhaps, is the elaborate design of Messrs. Carrère and Hastings for a large country house set at the end of a long narrow, rocky point projecting into Long Island Sound, and approached through a natural forest with which it has been united by formal gardening arrangements, conceived on a larger scale than has often been seen in this western world. This scheme, I hope, may soon be reproduced in these

pages; and likewise an interesting suggestion of Messrs. Bell & Langton's for the rearrangement of Madison Square in this city.

Many pictures of country houses, whether good or bad in themselves, gain interest by the incorporation of their environment in the architect's design. I do not mean that this environment is always better imagined than the house itself, or even as well imagined; merely that any proof that our architects are coming to realize the interdependence of the two arts is very welcome. One common fault is still the undue prominence of stretches of gravel in the vicinity of the main front of a house. Of course, it is often involved in the mistake of incorporating the carriage-entrance with this front. But there are instances where the carriage-drive runs to an entrance in another side of the house, yet, nevertheless, a gravel path cuts off the main façade from the lawn, not only offending the eye by its own barren line, but preventing any proper system of planting about the house to connect it integrally with the soil and give it an air of harmony, unity and repose. Summer days are few in our climate when a lawn is unfit to tread upon; and, to preserve its beauty and that of the house itself, other entrances than the one which should lead immediately to the grass might well be used upon these days. Messrs. Rossiter & Wright have grasped this idea in several excellent designs. A striking instance of too much gravel, necessitated in part by a faulty placing of entrances, is Messrs. Parfitt Brothers' "Three Houses at Hill Crest," No. 112. In their "House at Cedarhurst," No. 127, Messrs. Romeyn & Storer have drawn no gravel line between the main front and its lawn; but they have based the semicircular porch upon a wide rectangular stretch of flagstones, not even raised to form a terrace, which makes an ugly blot upon the lawn, and has not as much excuse in the way of possible convenience as a path.

No carriage drive reaches the door in the long façade of Messrs. Renwick, Aspinwall & Owen's "House at Baltimore," No. 148; but the straight path which approaches it, between two stretches of grass surrounded by low hedges, is absurdly broad—almost one-third the width of the façade. Apparently to relieve the barren effect thus produced, the centre of this path has been filled with a group of flower-beds, which, of course, as they are evidently out of place, merely add to its ugliness, and also interfere with the convenience of pedestrians. Equally bad, in another way, is Mr. A. P. Valentine, Jr.'s, "Plan of a House and Home Grounds," No. 179, where there is no grass at all, but a meaningless arrangement of multiplied straight-lined paths intersecting monotonous shrubberies; and still worse is Messrs. Jardine, Kent & Jardine's "First Study for a Country House near New York," No. 226. Here the large house stands upon a high terrace, and below this the foreground is filled with wide, contorted paths and large flower-beds of graceless and inharmonious shapes, encircling an oval basin of water which is not brought into any relation with the architectural lines beyond it. More ambitious and more interesting is Messrs. Snelling & Potter's "Sketch for a House at Tuxedo," where the disposition of the paths and drives is both sensible and pleasingly symmetrical.

In pleasing contrast with garden arrangements appropriate to our climate is the entrance path to a cottage at Burlingame, California, shown in a water-color drawing by Mr. A. Page Brown, No. 330. Among the distinctively rural structures which seem particularly good I may note Messrs. Wainright & Munoz's "Golf Club House at Seabright," No. 76, and Mr. Atterbury's "Model for a House on an Adirondack Lake," No. 373. This is an interesting example of a large house kept low, as is appropriate in the indicated situation, and built of stone and unhewn logs. It may be thought, however, that in the Adirondack woods a shingled roof would have more of the virtue of fitness than the tiled roof which the house now bears.

Several well-designed tombstones of a simple kind prove that we are gradually learning that it is not only large and costly memorials to our dead which demand an artist's care. Among them are Mr. Robert Brown's "Memorial Cross," No. 175, and the "John Hancock Memorial," No. 167, by Mr. Schweinfurth, the designer of the excellent simple tombstones, a series of which were published in GARDEN AND FOREST, vol. ii., p. 198. Very beautiful in a more elaborate way is the late Mr. Hunt's design for the Belmont tomb at Newport.

A dignified and wholly appropriate design is Messrs. Cady, Berg & See's "Memorial Gateway for Yale University," No. 339, with simple brick piers and delicate elaborate wrought-iron work. In a series of beautifully executed water-color drawings, Messrs. Howard & Cauldwell suggest a number of gateways for the new parks in the northern part of New York city. Their conceptions are excellent, in so far as the modest size and open, unobstructive air which should characterize the entrances to naturalistic parks are concerned. But the particular architectural style chosen for their piers and pillars seems less well imagined. Something more simply classical would be more pleasing to a cultivated taste and more in keeping with the general character which American architecture bids fair to develop, than these rather heavy, baroque, seventeenth-century motives. And a singular carelessness of the requirements of scale is seen in the same artists' "Birds'-eye Perspective of Proposed Park and Approach to Grant's Tomb," No. 181. It is a good idea that Morningside Park and the Riverside Drive should be connected at this point, and that in this way a dignified vista should lead the eye toward the tomb when approached from the east. The idea is well carried out by making a wide, straight avenue form each end of the approach, while halfway between the two parks it broadens out into an open space covering the area of four city blocks. But this area is designed by Messrs. Howard & Cauldwell in a way that would be appropriate to a small courtyard. The features they have selected are so few and of such a character that only after long study does the observer realize how wide the included area really is. Quite a different scheme, and one of many more parts, would be needed to give the space of four city blocks a suitable effect. And, by the way, our general ignorance in regard even to the nomenclature of gardening art is shown by the fact that this bald and strictly formal arrangement is called a "park."

In conclusion, it may be said that, while the drawings in this exhibition show a commendable growth in the desire to utilize the resources of gardening art, they prove that our architects have still a great deal to learn, not merely with respect to its right management, but also with respect to its ideals and the difference between its various branches. They prove how very wise it was, even in such a case as that of the Goelet place at Newport, where only strictly formal gardening elements were desirable, to combine the work of a landscape-architect like Mr. Olmsted with that of an architect like Mr. Hunt.

New York City. *M. G. Van Rensselaer.*

American Carnation Society.

THE fifth annual convention of this progressive society brought together from various states the largest and most enthusiastic gathering of specialists in Carnation-culture which has ever met in this city. The Carnation has reached a leading place among commercial flowers, and there are, of course, novelties enough every season to tempt the most conservative grower who expects to keep his hold on the best market. Every year he sees fine profits made by some enterprising growers of kinds which take the popular fancy while the old kinds are scarcely paying the coal bills. Little wonder, then, if the Carnation exhibition which was held at the Grand Central Palace, in connection with the annual meeting, had very much the air of a speculative exchange, only the beautiful flowers softened what otherwise would have been its hard business aspect. There were many thousand flowers on the tables, but, as is usual in trade exhibitions, in not a great number of varieties. All the favorite varieties were shown in great profusion, and generally in the finest possible condition, except, possibly, the favorite Daybreak, which, curiously enough, while most plentiful, was in no single instance up to its best condition. Of previous introductions Bridesmaid took the honors for best pink; Storm King was the best white shown, and Meteor, Helen Keller and Bouton d'Or were the best of their respective colors, and all well shown. The most striking novelty for 1896 was Della Fox, a seedling from Myers & Santman, Chestnut Hill, Pennsylvania. This is said to be a cross between Grace Wilder and Daybreak, and is a most captivating shade of pink of the Daybreak quality, but much darker than that popular kind. In size, form, habit, etc., Della Fox apparently left nothing to be desired.

The exhibit of Mr. Hill, of Richmond, Indiana, was the centre of interest, as it comprised mostly novelties finely grown and most beautifully shown in masses tastefully set up in large vases. Mr. Hill's Jubilee has been seen here before, and it is likely to take the lead among the dark scarlet flowers. Abundance (1896) is a deep pink with rather short stems, and likely to be valuable for its freedom, especially when grown outside. Triumph, which is a purer pink, is thought to be very promising and of a high class. Armazindy is a scarlet flake of the largest size, hardly as refined as Helen Keller. Mr. Hill received a certificate for Flora Hill, a grand white, which has been grown three years, but is not ready for the market. The judges also gave a certificate and ninety-two points for Mrs. McBirney, a fine flower of the Daybreak order. Mr. J. N. May, being a judge, had nothing in competition, but made a most tasteful and attractive display of Mrs. Pierpont Morgan Roses, flanked by handsome Carnations, of which Maud Dean, when

offered, is sure to meet with favor as a fancy distinct variety of the first class, it being a dainty pink with depth of darker color at base of the petals. For a darker pink none seems to us more pleasing than Mr. May's Lena Saling, inclining, as it does, to the salmon. It is of great diameter, but not very deep. Peter Fisher, of Ellis, Massachusetts, exhibited the greatest variety of seedlings, and received honorable mention for Edith Foster, a promising white.

In spite of the numerous varieties of the Carnation, many of which to the layman seem much alike, there is room for others, for, after all, there are very few which, like William Scott and Daybreak, will grow in every soil and for every one.

Notes.

Strawberries, from Florida, are selling at the reasonable rate of fifty cents for a quart of well-grown fruit, and more delicate strawberries from near Charleston, protected under glass without any artificial heat, sold on Monday for $1.00 a box at wholesale. No better oranges are ever offered here than some of the last Jamaicas, now being sold at fifty to seventy-five cents a dozen. The last of the Jamaica grape-fruits will soon be followed by the earliest of this fruit from California.

The Smooth Brome Grass, Bromus inermis, of south-eastern Europe, is commended in a recent bulletin of the South Dakota Experiment Station as a valuable grass in that state, both for permanent pastures and for meadows. Other grasses at their best may give a better quality of hay, but none has been tried there which yields as good a return one year with another. All kinds of stock eat this Brome Grass readily, and an aftermath springs up immediately after it is cut, so that it makes good grazing for fall and early winter. It is hardy against cold and has great drought-resisting powers and is one of the very earliest grasses to start in the spring.

Four species of Eucalyptus in New South Wales are called Ironbark, the best of which is the so-called White or Gray Ironbark, E. paniculata. This wood is very heavy and hard; its most characteristic property, however, is a certain gumminess; when planed it shows more or less parallel lines of close fibre which resemble horn, and between these in the parts where the grain is more open are shallow pits filled with a resinous substance. The best Gray Ironbark is very pale, and can hardly be excelled by any wood for its combined strength and durability. Railway ties made of this wood, which have borne the heaviest traffic of the main line near Sydney for twenty-five years, are said to be as sound as they were when they were laid.

No insects are more dreaded by the general farmer than wire-worms, and we are glad that Mr. M. V. Slingerland has republished the essential parts of a bulletin, now out of print, which gave a detailed account of three years of experiments with these pests. A few recent observations are embodied in this new bulletin, so that the information is brought up to date. The practical summary of the whole is that there is no reliable way of protecting seed by poison or of destroying immature wire-worms in the soil. But the life-history of these worms shows that they live for three years at least in the larval state, and when fully grown they change to soft white pupæ in July, and the insect assumes its adult form in August. Singularly enough, the insect remains in the cell until the following April or May—that is, nearly an entire year—and they perish whenever the soil is disturbed so as to break these earthen cells. Of course, this indicates that if infested fields are plowed after the 20th of July, thoroughly pulverized and kept stirred up, many of these cells will be broken and the tender beetles destroyed. Wheat or rye may be sown after this cultivation. Farmers who practice a short rotation of crops and fall plowing will not be troubled seriously with wire-worms.

The windows of the flower shops have a suggestion of the Lenten season in their less rich and profuse dressing with simple blossoms for home use, instead of the more brilliant and gay flowers used for public social functions. The one striking decoration in the up-town Broadway establishments early this week was the large section of a tree, bare and wintry-looking, draped with Florida moss, the rich chrome and greenish gray of bark and moss, enlivened by luxuriant long sprays of Bougainvillea, all illuminated by tiny electric lights. This particular window held, with other flowers, a varied collection of choice Orchids, but, as a rule, the kinds of flowers which appeared most abundantly suggested the garden and meadow and woodland rather than the greenhouse and conservatory. Tulips of various colors and narcissus of many forms were most plentiful and sold for $1.00 a dozen. Roman hyacinths were among the most popular flowers. Dutch hyacinths showed the effect of the season in the unprofitable price of fifty cents a dozen, and freesias were plentiful at thirty-five cents a dozen. Four or five branches of lilacs, each carrying two panicles, cost $1.50, and a tight little nosegay of large single California violets the same price. A bunch of forget-me-nots, the winning little flowers peeping from luxuriant stems and foliage, could be had for fifty to seventy-five cents, and a dozen stalks of lily-of-the-valley brought but seventy-five cents.

Mr. B. E. Fernow, in an article in *The Independent*, to show that permanently good roads are an important element in any rational system of forestry, cites the example of the little city of Goslar, in the Harz Mountains, of Germany. This old town owns a forest of 7,500 acres, which the citizens treasure as one of their best investments, because it not only furnishes them outing grounds and good sport in the way of hunting, but with a sure and continuously increasing revenue. Under conservative management the annual cut is 350,000 cubic feet of wood, and the net income from the sale is, in round numbers, $25,000 a year, or $3.50 an acre a year, which is a good return from soil unfit for agriculture. Formerly the district was without good roads, but in 1875 the forest manager persuaded the city fathers to appropriate enough money to construct a first-class road system, which was gradually completed. In 1891, $25,000 had been spent on roads, and 141 miles of these roads were in good order. The manager kept an account of the influence of this improvement on the profits and cost of his forestry operations, and he was able to show that the annual cost of logging had been reduced by $2,450, the cost of hauling by $2,520, and the result of the sales due to the fact that much formerly unsalable material could now be disposed of and all could be transported more conveniently was increased by $3,255, being a net increase of $8,255, or nearly thirty-three per cent. of the amount invested in road improvements. On one road which was macadamized and maintained for a year at a cost of $7,440 an instructive comparison was made between the cost of hauling 470,000 cubic feet of wood over the old and over the new roads. On the old road 4,273 loads were required of 110 cubic feet each, and costing $3.60, or amounting in total to $15,282.80. On the new road the same quantity was moved in 2,652 loads of 177 cubic feet each, and the cost, at the same price a load, was $9,547.20, which means that the saving in haulage alone was $5,735, or seventy-five per cent. of the cost of the road in one year.

Among many sorts of fresh vegetables now in the regular stock of first-class dealers is asparagus from Missouri, which costs forty cents for six long white shoots, while the best from South Carolina costs $2.75 for a generous-sized bunch, and a dozen long green stalks from hot-houses in Illinois bring $1.10. Cauliflower is coming from near-by hot-houses, Florida and France, and costs fifteen to fifty cents a head. New peas, from Florida, the pods small, but well filled, cost ninety cents a half-peck, and well-grown string-beans from the south command thirty cents a quart. Okra, from Cuba, costs ten cents a dozen, and egg-plants, from Florida, bring twenty-five to thirty-five cents each. New beets come from Florida and Bermuda, a half-dozen bunched with the tops costing ten cents, and loose ones fifteen cents a quart. Kohl-rabi comes from the same localities, and cost fifteen cents for three. Tomatoes, from Florida, firm and well ripened, bring twenty-five cents a pound, the hot-house product from Pennsylvania costing forty cents. Tender radishes from near-by hot-houses may be had for seven cents a bunch, and rhubarb, grown under glass on Long Island, for ten cents. The supply of celery is partly drawn from Florida. Rochester furnishes some which is better blanched than that from the south and of sweeter flavor, while that from California is entirely white and brings seventy-five cents to $1.50 for a dozen stalks. New cabbage, from Florida, is not yet plentiful and costs twenty cents a head, that from Germany bringing half this price. Parsley comes mainly from Bermuda at this season. Dandelion, from Boston and near-by hot-houses, costs twenty-five cents a quart; Romaine lettuce, from Bermuda, fifteen cents a head; hot-house lettuce, from Boston, ten to fifteen cents, and larger heads, from Florida, ten to twenty cents each. Heads of chicory, with blanched centres, and the broader-leaved Escarolle cost fifteen cents each, while importations from France, the large heads fresh as though just gathered, command twenty-five cents. Mushrooms bring ninety cents a pound. Hot-house carrots cost five cents a bunch, and those from Bermuda seven to ten cents, and hot-house cucumbers from Boston are a luxury at thirty to thirty-five cents apiece.